# approach

JUNE 1981 THE NAVAL AVIATION SAFETY REVIEW

# It Is Your Business!

IF you see a guy whipping around in a piece of GSE near your automobile, will you stop him and tell him to slow down and watch out? What if you walk out your front door and spot your kid standing dangerously close to a city maintenance department's tree trimming operation? Will you tell him or her to get out of the way? Sure you will! After all, it's your car and your kid. It's your personal business.

But what if you're strolling through the hangar and see a man working on an aircraft with an electric grinder but wearing no eye protection? Will you walk over and have a little heart-to-heart conversation with the gent? Will you take the time to go find his supervisor and tell him what you observed? Or what if you join up on the duty tanker pilot flying along with his oxygen mask off and smoking a cigarette? Will you remind him of the illegality of his actions? Will you go find his safety officer after the flight and report what you saw? Quite possibly, you'll do nothing! You will most likely decide it's not really your business. But this is where you're dead wrong!

If you are in the Navy and you see an action jeopardizing Navy personnel or Navy equipment, it is your business. It's your responsibility, your duty, to take action. The secret pleasure you may feel when you witness a foulup by another squadron has no place in today's Navy — particularly in the area of safety. The Navy's resources in men and material are far too scarce to allow room for parochial interests, whether they be in the form of an individual, a division, a squadron, or a wing.

So, the next time you amble down the flightdeck or gaze across the hangar and see someone doing something wrong (or even questionable), do something about it. It doesn't matter whether the people involved are senior or junior to you, in your unit or another. It doesn't matter if you're the assistant administrative officer and not the safety officer. In fact, it doesn't even matter if you're not an officer. You may not get a warm reception, but you may save an aircraft or a life. Dangerous events happen around you every day. Why not muster up the courage to stop them? It is your business!

LT Dale Smith

Vol. 26 No. 12

# approach

NAVAIR 00-75-510


*The T-2X on the cover is North American Rockwell's proposed aircraft for the VTXTS program. (Painting by Dwight Greenwalt courtesy of Rockwell International, North American Aircraft Division.)*







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# THE INVISIBLE FORCE

By Russ Forbush
APPROACH Writer

The invisible force is visible in the photo at left. What you see is the wake turbulence generated by the starboard wing of a Boeing 747 as it flew upwind "into the page" and to the right of the smoke tower. (The port wing vortex has already passed through the smoke tower and off to the left.)



IT was a beautiful day at the NAS – blue sky, 40 miles of visibility, and calm winds. A flight of four arrived for landing and was cleared by the tower to break in order. Two F-4s were Nos. 1 and 2, and two F-5s were Nos. 3 and 4.

The lead pilot established his aircraft on final and lined up on the right side of the duty runway. Following a glide slope correction, the lead continued in to the field and made an uneventful landing.

While completing the last 45 degrees to final, the No. 2 F-4 slightly overshot the runway centerline and encountered a very brief, slight amount of jetwash. The pilot picked up a centered ball at 1 mile, made a small heading correction to line up with the left side of the runway, and continued his approach in a stabilized, wings-level, onspeed condition at about 150 KIAS.

Fifteen seconds after encountering the initial jetwash, and without warning, the left wing dropped violently about 60 degrees down, and the nose of the *Phantom II* sliced down and left approximately 20 degrees. The pilot immediately selected full afterburner, applied right aileron and rudder, attempted to level the wings, and began feeding in back stick in an effort to reestablish a climb attitude. The F-4 continued to settle, so the nose was lowered in an attempt to reduce the angle-of-attack. The pilot was then able to roll the aircraft nearly wings level before raising the nose above the horizon. The F-4, now about 20 degrees noseup with the right wing down 10 degrees, continued to settle towards the ground.

At a point about one-half mile from the approach end of the runway, the underside of the starboard stabilator grazed an approach light fixture, and the stabilator tip then scraped the ground. A second and third set of approach lights were then hit, causing additional damage including a blown left main tire. The aircraft became airborne, and the pilot was able to climb to 2,000 feet. The pilot performed a controllability check and was checked for damage by the pilot of the No. 3 aircraft in the flight. This was followed by a precautionary, shortfield, arrested landing. The aircraft was shut down, and the aircrew egressed normally.

If you guessed that this escapade resulted from a bout with wake turbulence, you're right! Conditions were ideal for this sinister phenomenon to strike – calm wind, with a very slight tailwind at 200 to 300 feet AGL, transiently localized the wake turbulence generated by the lead aircraft on a portion of the flightpath being flown by No. 2. Continued

APPROACH (USPS 016-510) is a monthly publication published by Commander, Naval Safety Center, Norfolk, VA 23511. Subscription price is $15.00 per year; $3.75 additional for foreign mailing. Subscription requests should be directed to: Superintendent of Documents, Government Printing Office, Washington, DC 20402. Controlled circulation postage paid at Norfolk, VA.

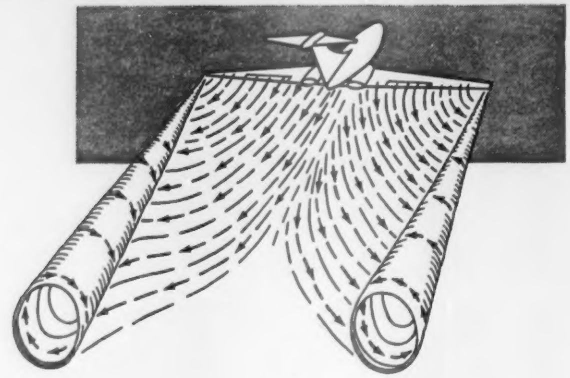


Fig. 1

Much emphasis has been placed on wake turbulence from big jets, yet this mishap involved two fighter aircraft of the same model. There have been enough similar encounters during the past few years to indicate that a review of wake turbulence is in order. Since a picture is worth a thousand words, many diagrams follow which should provide a clear understanding of wake turbulence, its effect on aircraft, and recommended avoidance procedures.

Wake turbulence is primarily a product of lift and takes the form of vortices rolling off the wingtips and trailing behind and below the aircraft. Lift is generated by the creation of a pressure differential over the wing surfaces. The lowest pressure occurs over the upper wing surface, and the highest pressure under the wing. This differential triggers the rollup of the airflow aft of the wing, resulting in swirling air masses trailing downstream of the wingtips. After the rollup is completed, the wake consists of two counterrotating cylindrical vortices (see Fig. 1).

The strength of the vortex is governed by the weight, speed, and shape of the wing of the generating aircraft. The vortex characteristics of any given aircraft can be changed by the extension of flaps or other wing-configuring devices, as well as by changes in speed. As the primary factor is weight, however, the vortex strength increases proportionate to the aircraft weight. The greatest vortex strength occurs when the generating aircraft is **HEAVY**, **CLEAN**, and **SLOW**!

While structural damage may result from a violent wake turbulence encounter, the biggest hazard when flying up the core of a vortex is induced roll (see Fig. 2). Aircraft with long wingspans have the best of it here. If the ailerons extend beyond the vortex, countercontrol would be more effective than for short wingspan aircraft which may have the entire

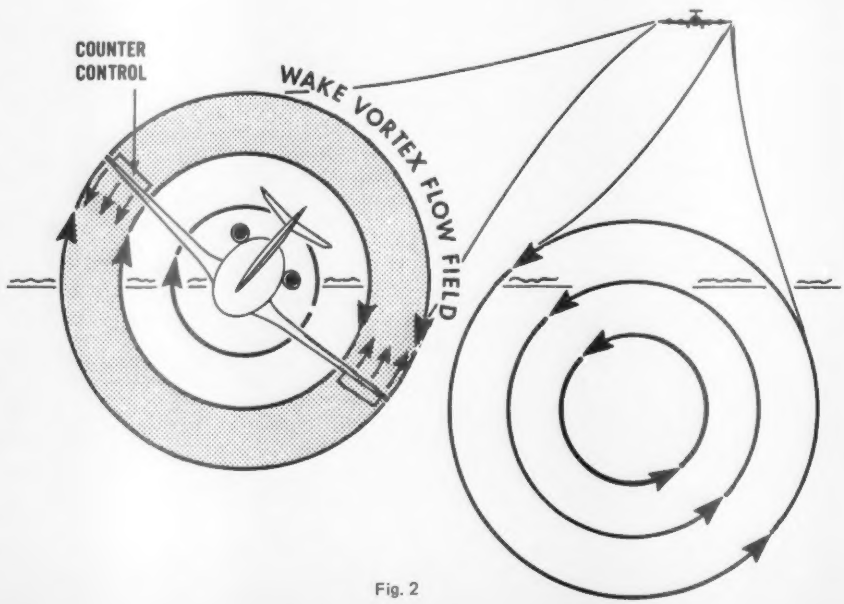



Fig. 2

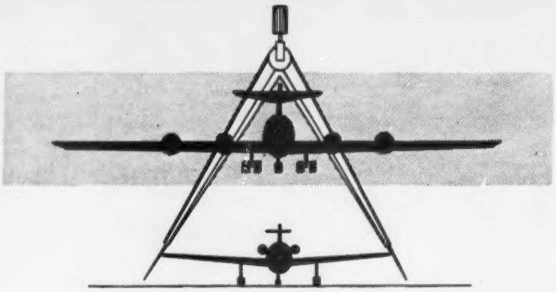


Fig. 3

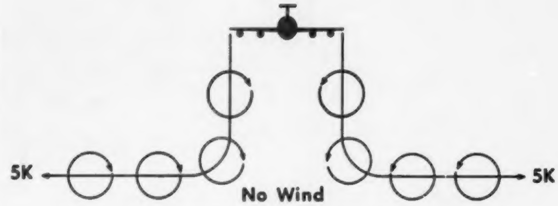
wingspan within the vortex (see Fig. 3). In the latter case, countercontrol capability may not be great enough to stop the roll.

Trailing vortices have certain behavioral characteristics which can help a pilot visualize the wake location and thereby take avoidance precautions.

Vortices are generated from the moment an aircraft's nose leaves the ground, since trailing vortices are a byproduct of lift. Prior to takeoff or touchdown, pilots should note the rotation or touchdown point of the preceding aircraft.

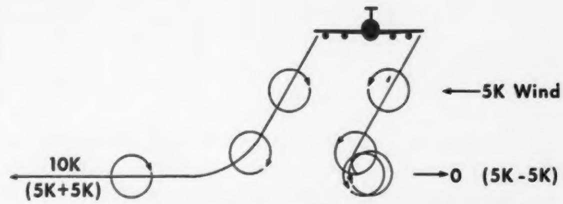
Vortex circulation is outward, upward, and around the wingtips when viewed from either ahead or behind the aircraft. Tests with large aircraft have shown that the vortex flow field, in a plane cutting through the wake at any point downstream, covers an area about two wingspans in width and one wingspan in depth. The vortices retain this spacing (about a wingspan apart) even when drifting with the wind at altitudes greater than a wingspan from the ground. Therefore, if persistent vortex turbulence is encountered, a slight change of altitude and lateral position (preferably upwind) should provide a flightpath clear of turbulence.

Flight tests have shown that the vortices from large aircraft sink at a rate of about 400 to 500 fpm (the sink rate for smaller aircraft will be proportionately less). They tend to level off at a distance about 900 feet below the flightpath of the generating aircraft. Atmospheric turbulence hastens breakup. Pilots should fly at or above the large aircraft's flightpath, altering course as necessary to avoid the area behind and below the generating aircraft (see Fig. 4).




Vortex Movement Near Ground - No Wind

Fig. 5




Vortex Movement Near Ground - with Cross Wind

Fig. 6

When the vortices of large aircraft sink close to the ground (within about 200 feet), they tend to move laterally over the ground at a speed of about 5 knots (see Fig. 5). A crosswind will decrease the lateral movement of the upwind vortex and increase the movement of the downwind vortex (see Fig. 6). Thus, a light wind of about 3 to 7 knots could result in the upwind vortex remaining in the touchdown zone for a period

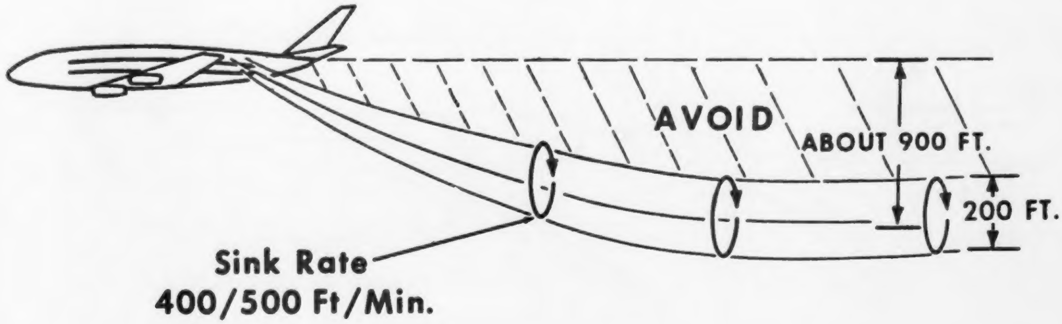



Fig. 4

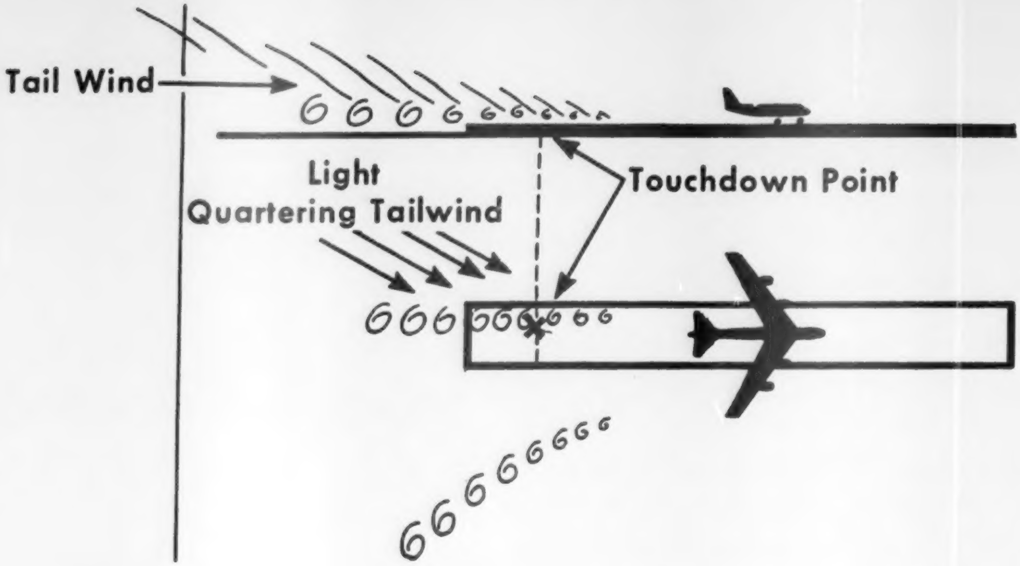



Fig. 7

of time (see Fig. 7) and hasten the drift of the downwind vortex toward another runway. Similarly, a tailwind condition can move the vortices of the preceding aircraft forward into the touchdown area. **The light quartering tailwind requires maximum caution.** Pilots must be alert to large aircraft upwind from their approach and takeoff flightpaths.

6

A wake turbulence encounter is not necessarily hazardous. It can be one or more jolts with varying severity depending upon the direction of the encounter, distance from the generating aircraft, and point of vortex encounter. The probability of induced roll increases when the encountering aircraft's heading is generally aligned with the vortex trail or flightpath of the generating aircraft. **Avoid the area below and behind the generating aircraft, especially at low altitude where even a momentary wake encounter could be hazardous.**

Pilots should be particularly alert in calm wind conditions and situations where the vortices could:

- Remain in the touchdown area.
- Drift from aircraft operating on a nearby runway.
- Sink into the takeoff or landing path from a crossing runway.
- Sink into the traffic pattern from other airport operations.
- Sink into the flightpath of VFR traffic operating at the hemispheric altitude of 500 feet and below.

The following vortex avoidance procedures are recommended for the situations shown:

- Landing behind a large aircraft on the same runway. Stay at or above the large aircraft's final approach flightpath, note his touchdown point, and land beyond it (see Fig. 8).

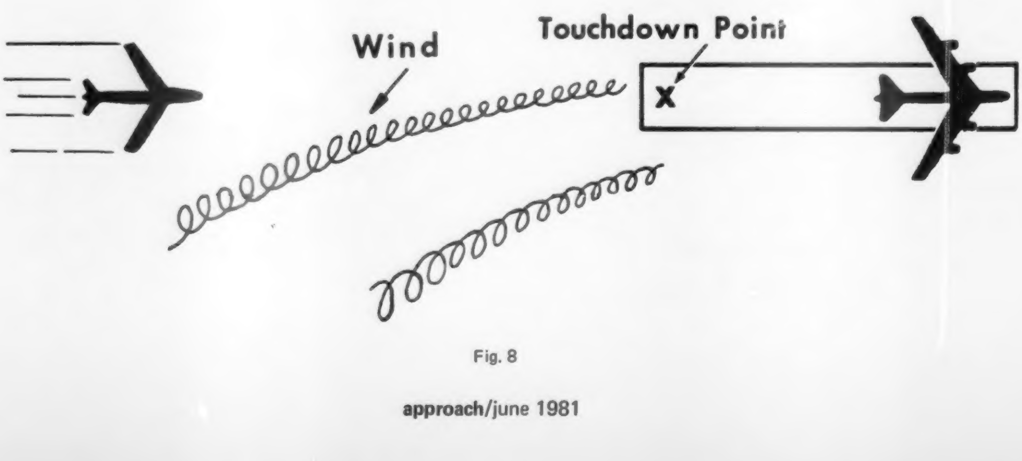



Fig. 8

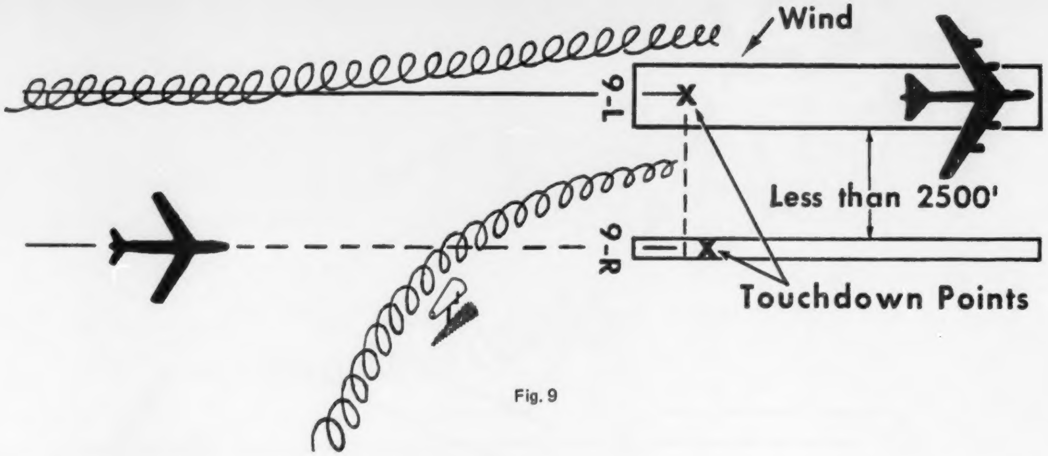



Fig. 9

• Landing behind a large aircraft when a parallel runway is closer than 2,500 feet. Consider possible drift to your runway. Stay at or above the large aircraft's final approach flightpath and note its touchdown point (see Fig. 9).

• Landing after a large aircraft on a crossing runway. Cross above the large aircraft's flightpath (see Fig. 10).

• Landing behind a departing large aircraft on the same runway. Note aircraft's rotation point and land well prior to it (see Fig. 11).

• Landing after the departure of a large aircraft on a crossing runway. Note the aircraft's rotation point – if past the intersection, continue the approach. Land prior to the intersection (see Fig. 12). If the large aircraft rotates prior to the intersection, avoid flight below its flightpath. Abandon the



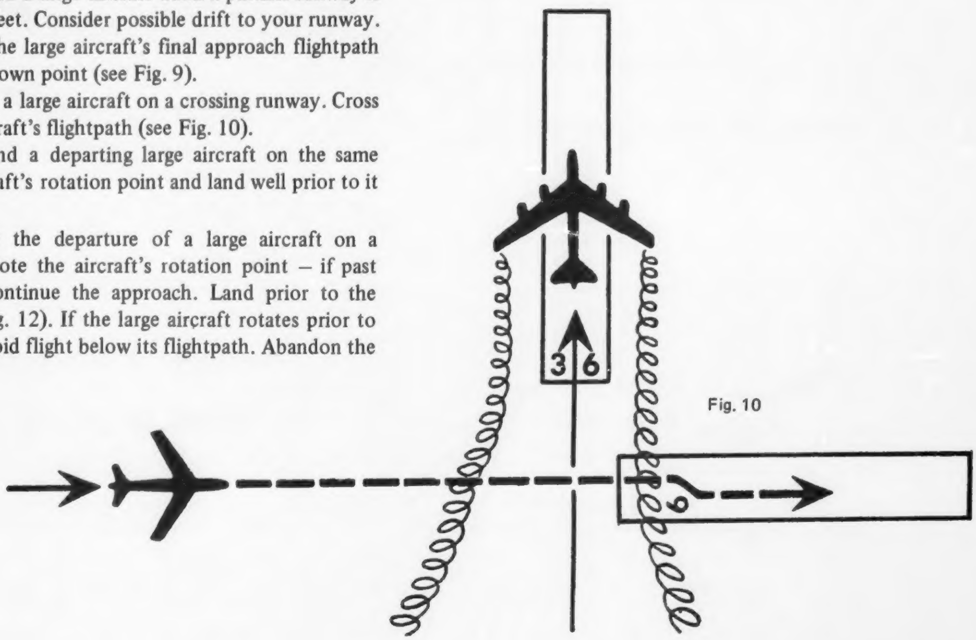



Fig. 10

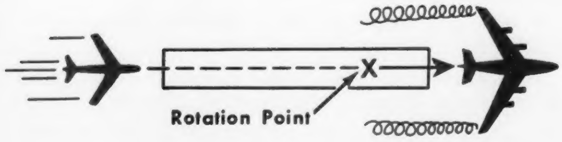



Fig. 11

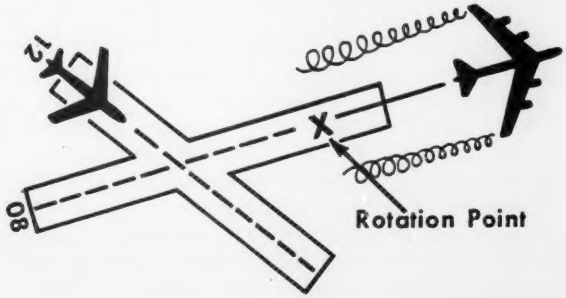



Fig. 12

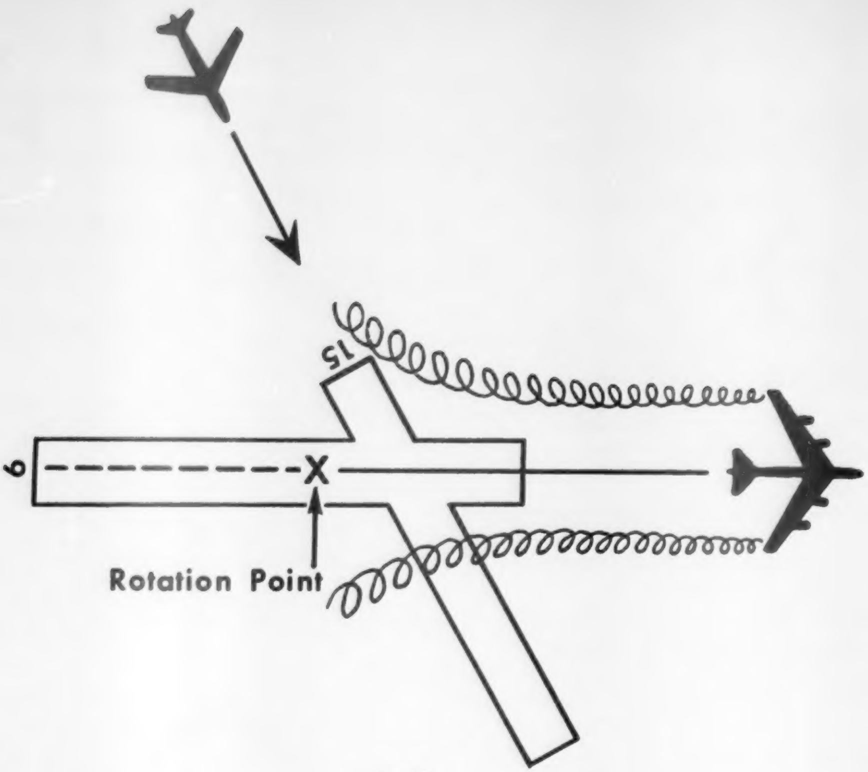



Fig. 13



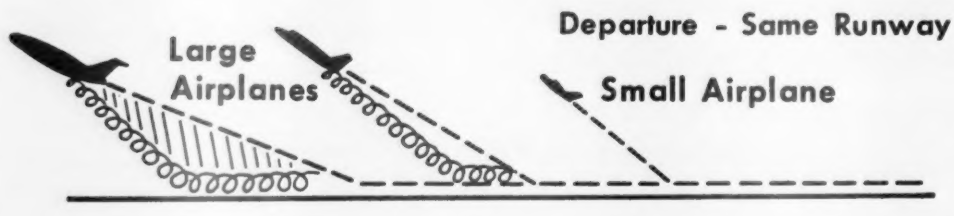



Fig. 14

approach unless a landing is assured well before reaching the intersection (see Fig. 13).

• Departing behind a large aircraft. Note the aircraft's rotation point and rotate prior to this point. Continue to climb above and stay upwind until turning clear of his wake (see Fig. 14). Avoid headings which will cross below and behind a large aircraft (see Fig. 15). Be alert for any critical takeoff situation which could lead to a vortex encounter (see Fig. 16).

**Helicopters**. A hovering helicopter generates a downwash from its main rotor(s) similar to the propwash of a conventional aircraft. In forward flight, however, this energy is transformed into a pair of trailing vortices similar to wingtip vortices of fixed-wing aircraft. Aircraft should avoid these vortices as well as the downwash (see Fig.17).

Leo Garodz of the FAA Technical Center has been involved with comprehensive wake turbulence testing, and he passes on the following information about tactical military aircraft and wake turbulence:

• When in a heavy wingload configuration, the intensity of trailing vortices is measurably increased.

• During gunnery runs or other maneuvers involving high speed and high G-forces, wake intensity is greatly increased.

• The proximity in which military aircraft operate relative to each other during many maneuvers makes them vulnerable to a wake encounter.

There you have it – a fairly comprehensive look at that invisible force known as wake turbulence. While it is not a major cause of Navy aircraft mishaps, it is a sinister phenome-

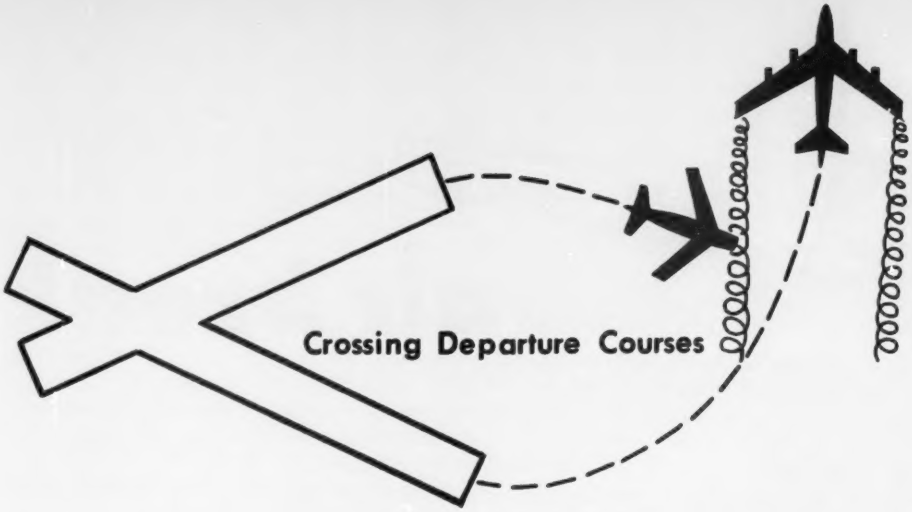



Fig. 15

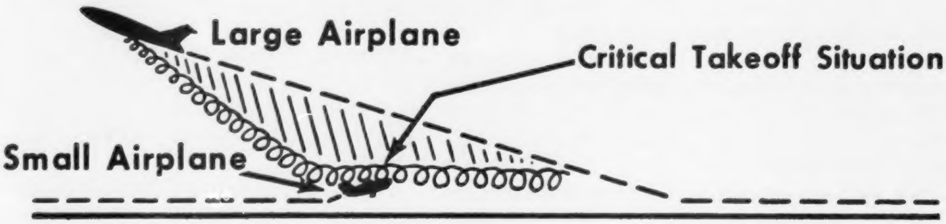



Fig. 16

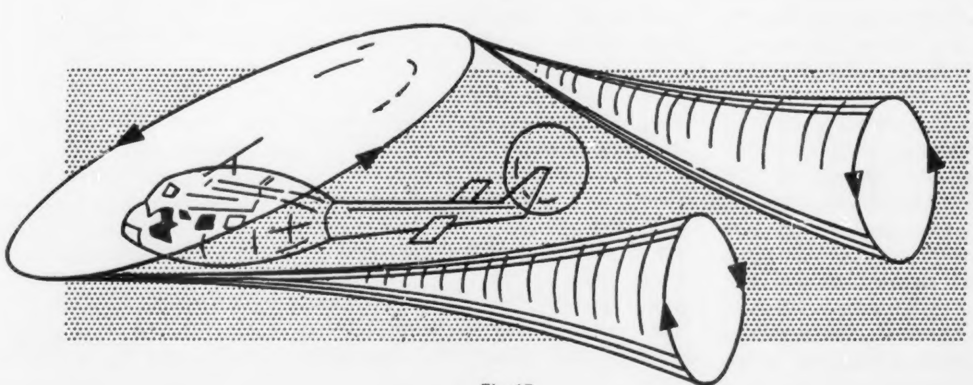


Fig. 17

non that can strike with great force and little or no warning. This is apparent in the mishap described at the beginning of this article (remember, the generating F-4 is not a jumbo jet). Aviation commands would do well to give maximum publicity to the contents herein and include wake turbulence in their periodic training programs.

*APPROACH gratefully acknowledges the assistance rendered by Leo Garodz, FAA Technical Center, in the preparation of this article.*

# air breaks



**Viking Intruded.** The A-6 was taxied at night behind catapult No. 1 with its wings spread (SOP to prevent structural damage from jet blast of aircraft in tension on the cat). After the aircraft on the cat launched, the director backing the cat passed the A-6 to the director spotting the cat, then departed to taxi another aircraft. An S-3 was spotted forward on the No. 1 elevator, but not pushed back, wheels flush against the deck edge as is normal procedure. The A-6 crew was going through its normal pretakeoff checklists, lowering the *Intruder's* flaps and slats, and following the directors' signals.

The catapult spotter director did not see the A-6 squadron maintenance personnel signal with wands for an emergency stop. They knew, but the director could not see, that the A-6's wing was about to contact the radome of the *Viking.* It did, with about 2 feet of overlap. The S-3 received limited damage, the A-6 none. It could very well have been worse.

The flight deck directors were following a habit pattern that worked well when all aircraft were in their usual spots, but this night they were not. The director backing the catapult did not properly clear the S-3 before passing the A-6 to the catapult spotter. The S-3 was spotted farther out from the flight deck edge than its normal position. The catapult spotter could not adequately see the restrictive clearance because of the darkness and the steam from the cat. The aircrew was preoccupied with the pretakeoff checklists and did not verify taxi clearance.

The *Viking,* in this case, required additional vigilance by all concerned. The director backing the cat should have made certain that the *Intruder* would clear before passing it to the cat spotter. The cat spotter should have ensured that the A-6 was clear before he taxied it, or requested via radio for someone to verify the clearance.

Although confidence in the director is necessary, aircrews should be alert to possible obstacles when taxiing, particularly at night. Safety and efficiency on the flight deck are achieved by following established SOP, by checks and counterchecks, and by every man's vigilance on deck. No shortcuts, mates!

**Unchocked and Unmanned.** Upon termination of a ferry flight, the C-130 was parked on NAS SOUTHPAC's transient ramp, which has a slight downslope towards the tower. The nose gear was chocked using standard transient line chocks. No approved C-130 chocks were available at the air station nor were any brought along on the flight. No substitute 8-inch chocks or tiedowns were used to help secure the *Hercules* in the 15-20-knot, 90-degree crosswind blowing across the ramp. The parking brake was released for overnight parking as recommended by NATOPS.

Approximately 2 hours later, the wind was able to work the aircraft loose from the standard chocks, and the C-130 began its wayward journey across the ramp. It traveled, undaunted, for about 100 yards before coming to rest with the port mainmount against a concrete curb near the tower. No material damage was noted during the postincident inspection. Whew!

Needless to say, the aircraft commander failed to ensure that adequate security was provided for his aircraft under the existing conditions. His crew also failed to do its required job. Aircrews — don't assume that aircraft security will be taken care of by transient personnel, even when on an airfield from which that model aircraft operates!

**Don't Hand Us That Line.** There are literally thousands of known dangers associated with aircraft flight. On occasion, however, one pops up which is a little bit out of the ordinary. The incident which follows is one of them.

A P-3 had just completed its fifth touch-and-go landing at the NAS and was on takeoff roll for number six when informed by the tower that a wire was entangled on the horizontal stabilizer. The wire had been observed by a second P-3 crew who was holding short for takeoff. The pilot of the rolling P-3 successfully aborted the takeoff while at an airspeed of about 50 KIAS and returned to the line for maintenance assistance.

An inspection revealed that a large, entangled mass of nylon line, similar

to that used for fishing, was wrapped around the right trailing edge of the horizontal stabilizer. The line was removed with no damage to the aircraft.

Quick action on the part of the holding P-3 crew, who informed the tower of the line, and the tower's immediate notification to the rolling P-3 allowed the pilot to abort the flight and prevent what might have been a subsequent accident.

It was surmised that the nylon line came from a kite being flown by someone nearby. That is, of course, unless the "Jolly Green Giant" was fly casting on a body of water in the vicinity of the NAS.

**On a Wing and a Bird.** Two recent incidents are worthy of mention. One involved a wing, the other a bird. Both pinpoint a lack of prudence and common sense on the part of aircrew personnel.

**The Wing.** A P-3 returned to the chocks with the No. 1 and 4 engines secured. The flight engineer (FE) requested that the PPC place the No. 3 engine at ground idle so that he (the FE) could remove the starboard overwing hatch to get a better look at a suspected fuel leak. Unbeknown to the PPC, the FE clambered out onto the wing and was subsequently observed leaning over the leading edge of the wing between the No. 3 and 4 engines, with No. 3 turning at ground idle.

The CO's response to the FE's action was, "It would be nice if this sort of incident was only what CO and safety officer nightmares were made of. Unfortunately, it really happened, and if it happened to us, it can happen to you. This incident has been discussed within this squadron, at a wing safety meeting, and will be a subject of discussion at an upcoming standardization board meeting. All squadron aircrews have been made absolutely aware that there is no reason, ever, for anyone to be on the wing of an aircraft while an engine is turning." Amen!

**The Bird.** Upon approach to an east coast airfield, an F-14 ingested a bird in one of its engines, stalling same. The aircraft proceeded in and made an uneventful landing at the field. After taking care of their business, the crew talked over the situation and decided that the engine was **probably** not FODed. They launched for their Homebase and arrived without incident. A subsequent maintenance investigation revealed that there was no "probably" about it – the engine was a reject for FOD – fowl feathers, feet, beak, and all. One of the heavies stated, "This is the most classic example of industrial strength get-home-itis I have ever witnessed and constitutes a serious lapse of prudence and common sense. If an engine ingests a bird, **it is FODed – period.** That aircraft is down until repaired." It is obvious that the decision of this crew to press on for Homebase with one engine FODed was "strictly for the birds."


*"You're not putting down just for a lil' ole birdstrike, are you?"*

**Haste Makes Waste – Sometimes.** A pilot confronted with an extreme emergency situation must take immediate corrective action. He has no other choice. When time permits, however, hasty actions should be avoided, the problem assessed, and a logical solution to the problem reached. The following narration is one example of how a pilot's reflex action in response to an unusual situation resulted in a costly mistake.

An A-6E was making a night approach to an NAS when the pilot's landing checklist lights went out after transition to the landing configuration. At the time, the *Intruder* was between cloud layers at 4,000 feet and was at 230 KIAS. The pilot immediately reached forward to strike the landing checklist panel with his fingers extended in an attempt to regain illumination of the panel. In so doing, he inadvertently struck the emergency jettison button (1 inch above the checklist on the panel), jettisoning a MER and two droptanks. Fortunately, the A-6E was over open water and there was no injury to personnel or damage to property.

The incident report noted that the mishap pilot was experienced and highly qualified in the A-6E, yet he erred by responding reflexively to a nonemergency situation. This hasty action ultimately led to the loss of a MER and two droptanks, which cost the Navy $15,400.

The old axiom "Haste makes waste" was evident in this incident. With all the buttons and switches in the cockpit, the pilot should take whatever time is available to him to think out the proper solution before taking any action. ◄


# FUEL STARVATION

By Bill Peters
APPROACH Writer

*"309 abeam with the gear; full stop."*
*"309, wind 100 at 9, cleared to land 13L."*
*"Understand cleared to land on the left."*
*"309 just had a flameout."*
*"Roger that, 309."*
*"328, we have an alert COND III off the approach end of the [duty] runway, go around the left side of the left [runway], DELTA EASY 2,000."*

HOW did a fleet-experienced, instructor pilot (IP) allow himself to get into a situation which resulted in a fuel-starvation flameout at the 90-degree position during a final landing approach to his homefield?

The lieutenant IP and his ensign student had briefed, preflighted, and manned their T-2C for a scheduled 1.5-hour basic instrument flight from NAS Southwest. After 1:15 hours of routine syllabus maneuvers within the local operating area, the lieutenant took control and set up the student at 15,000 feet MSL for a TACAN penetration to a missed approach, low approach with a GCA pickup.

The ensign checked in with the approach control facility, and positive radar and radio contact was established. Several aircraft were reported in the vicinity during the approach,

and the IP acknowledged and confirmed visual contact with each. The altimeter setting was given as 29.94. Local weather was reported as clear with widely scattered cumulus clouds, an 11°F temperature/dewpoint spread, and surface winds 120 at 8 knots. VMC all the way!

The student completed the penetration and executed a missed approach at 1:32 after takeoff. GCA pickup was immediate, and the aircraft was vectored to a modified box radar pattern at 3,000 feet MSL. At this point, the IP requested a full-stop landing at the completion of the GCA. The aircraft had now been airborne for 1:35.

Approach Control continued with the vectors and cleared the T-2 to descend to 1,500 feet in preparation for a PAR pickup. Precision radar picked up the aircraft and passed missed approach procedures to the crew. Because of a missed channel assignment, PAR was unable to communicate traffic separation instructions to another T-2 overtaking our GCA bird. Final Control was forced to order a waveoff at 1,000 feet and 3.5 miles to ensure safe aircraft separation. The aircraft had now been airborne for 1:40.

The IP requested reasons for the vectors, was informed of the overtaking situation, and was advised that he could expect no delay for a GCA to a final landing. The student responded to the radar vectors, and the aircraft was leveled at 1,500 feet. As the aircraft turned to final, after another modified box pattern, the crew was informed that the runway was fouled by a T-2 tractor and escort while a gunnery tow banner was being rigged for launch. Another missed approach was ordered by GCA at 3 miles to touchdown. Our T-2 had been airborne for 1:46 at this time.

The squadron SOP for declaring "minimum fuel" was 650 pounds, but the lieutenant inexplicably requested a touch-and-go after switching to Tower frequency for entry into the VFR pattern. His fuel state was 600 pounds with the low-level warning light illuminated! The tower advised that no touch-and-go could be approved since the runway was still fouled and estimated a landing delay of 2 or 3 minutes. Upon executing a foul deck waveoff, the instructor pilot belatedly declared "minimum fuel" and a desire for expeditious approval of his landing clearance request. The aircraft remained in the dirty configuration with landing gear down and landing flaps extended. The aircraft had now been airborne for 1:53.

The T-2 was cleared downwind to take interval on another T-2 in the VFR pattern and received another foul deck waveoff with a fuel state of 400 pounds *indicated.* At this point, another T-2 pilot on the ground, monitoring Tower frequency, pointed out that other off-duty runways, although closed for routine traffic, were available for *emergency* landings. There is no indication that the IP heard this transmission, but his request was approved for a priority turn to the downwind leg, and he was informed by the tower that no landing delay existed.

The IP was downwind, cleared for a final landing, with a fuel state of 200 pounds *indicated!* The aircraft had been airborne for 1:56. At no time had he declared "emergency fuel."

The dialogue between the tower and the T-2 was extracted from the tower tapes and appears at the beginning of this article. At approximately the 90-degree position in the pattern, the port engine flamed out, followed shortly by a flameout of the starboard engine. Correctly assessing the existing altitude and sink rate as being outside the envelope of the LS-1 escape system, the crew elected to remain in the aircraft. The IP attempted to salvage the approach by maintaining flying speed until it became evident that the aircraft would contact the ground well short of the runway threshold. As a last-ditch maneuver, the IP attempted to flare the doomed *Buckeye* to reduce the sink rate prior to impact. Flameout occurred after the aircraft had been airborne for 1:58.

The aircraft touched down 225 feet short of the runway threshold, shearing all landing gear on impact. The aircraft sustained strike damage, and the IP sustained compression fractures of T-11, T-12, and L-1 vertebrae. The SNA was not injured.

A series of factors contributed to this mishap which resulted in the loss of a valuable training aircraft and serious injury to the IP. Taken individually, none of these factors seems indicative of a significant causal factor in an aircraft mishap. But collectively, each became another building block in a structure that overtaxed the capabilities of the players.

- A missed channel change by another T-2 made it impossible for the PAR personnel to communicate spacing instructions to its crew. The resulting overtaking situation necessitated the missed approach orders to the mishap aircraft. At this time, the runway was still clear and the flight should have been expected to terminate in a successful GCA to a full-stop landing. Building block I.
- An inordinate amount of delay was encountered in completing the banner hookup to the tractor aircraft on the runway due to a fouled tow cable reel. Single-runway procedures were in effect, with the parallel duty runway closed due to recent resurfacing operations. The banner and escort aircraft were fouling the intersection of the off-duty runway. Building block II.
- The GCA final controller and the IP both were unaware of the foul deck situation until the aircraft was on GCA final during the second precision approach. Building block

III.

• The IP assumed that the indicated fuel was equal to the actual fuel onboard. NATOPS gives no indication of fuel gage accuracy. Building block IV.

• The IP failed to declare "emergency fuel" at 450 pounds in accordance with squadron SOP. Building block V.

• The IP failed to conserve fuel at the first sign of a landing delay or to avail himself of other available runways to effect a safe and expeditious final landing prior to fuel exhaustion. Building block VI.

The responsibility for safe conduct of the flight rests with the flight leader, or the IP in the training environment. This emphatically includes declaration of an emergency when an *extremis* situation is developing – *before it actually becomes a mishap.* The PIC must have the intuitive ability to weigh all the factors affecting the safety of his aircraft and crew in light of existing regulations, aircraft performance, and the limitations of personnel and facilities.

The IP in this case failed to properly assess the cumulative effect of all pertinent events as they affected the safe recovery of his aircraft. In an effort to complete the basic instrument syllabus training mission, he pressed on until reaching "minimum fuel" with the intention of making a full-stop landing at the conclusion of his second GCA. Once he had shifted to Tower and discovered that the only available runway was fouled, he correctly declared "minimum fuel" but remained in the VFR pattern, in a dirty configuration, making two additional approaches before the runway was cleared.

Performance figures, extracted from the NATOPS Flight Manual, indicate that had the IP cleaned up the aircraft, initiated an immediate climb to 4,000 feet at the first sign of a landing clearance delay, and set up an emergency landing pattern (Section V, NATOPS) at the specified maximum endurance airspeed of 130 KIAS, he would have had a clean fuel flow of somewhat less than 1,600 pounds per hour and an indicated fuel state of 500 pounds. Assuming a fuel gage error of 100 pounds, that still would have given him an endurance of 14.5 minutes plus the advantage of being set up for a possible power-off approach. However, he remained in the dirty configuration, burning approximately 5,000 pounds per hour, and flamed out in 5 minutes with a fuel state of somewhat less than 100 pounds *indicated.*

Consider a subject to be covered during your squadron's next Safety Standdown: "Fouled deck profiles to use in the event of single-runway operations." "What is the best altitude to climb to and hold with various increments of fuel remaining after the fuel low level light comes on?" "How long a delay can I accept for landing clearance with the above fuel states?"

A foul deck endurance data card is a valuable asset to carry on your kneeboard, especially after your Ops boss or flight officer has taken it out and flight checked the numbers. The flight isn't complete until your bird is safely back in the chocks and the yellow sheet/MAF is in the hands of Maintenance Control. ◄



### Be a Blue Angel

THE United States Navy Flight Demonstration Squadron, The Blue Angels, will be selecting one pilot and a Flight Leader this year for their 1982 team. Selections will be made in September 1981, but interested officers are encouraged to submit their applications as soon as possible.

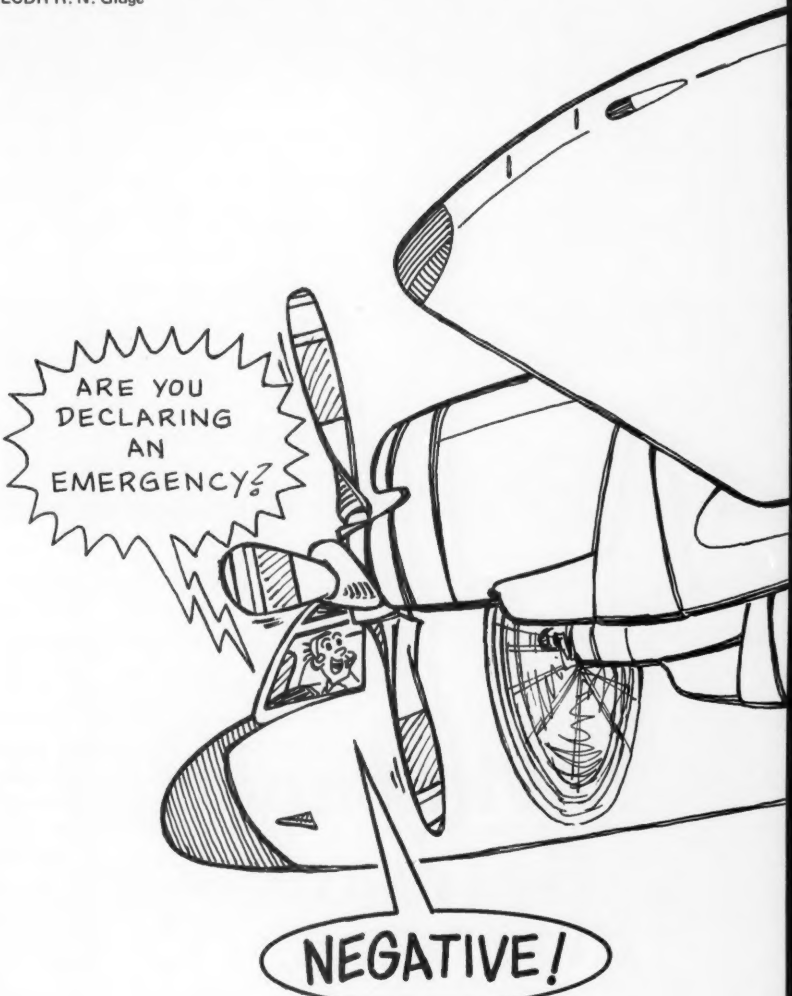
Applicants for demonstration pilot should be tactical jet pilots with no less than 1,500 hours flight time, regular naval officers, and rotating to or on shore duty. Letters of application should be endorsed by the commanding officer and forwarded to the Navy Flight Demonstration Squadron with a copy to the Chief of Naval Air Training and the Chief of Naval Personnel (Pers-433A) or Commandant Marine Corps (Code AA) for Marines.

Officers interested in the position of Flight Leader must have a minimum of 3,500 hours flight time, be lieutenant commanders or commanders who have screened for aviation command and, preferably (though not mandatory), have had command of a tactical jet squadron. Flight Leader applicants should submit their letters directly to the Chief of Naval Air Training with information copies to the Commanding Officer, Navy Flight Demonstration Squadron and the Chief of Naval Personnel (Pers-433A).

All letters of application should include each officer's experience and qualifications. Any further questions can be answered by contacting the Blue Angels via telephone (Autovon: 922-2584/2585, Commercial: 904/452-2583/2584) or corresponding with the Blue Angels, Naval Air Station, Pensacola, FL 32508.

# *When do you declare an emergency?*

By LCDR R. N. Gidge



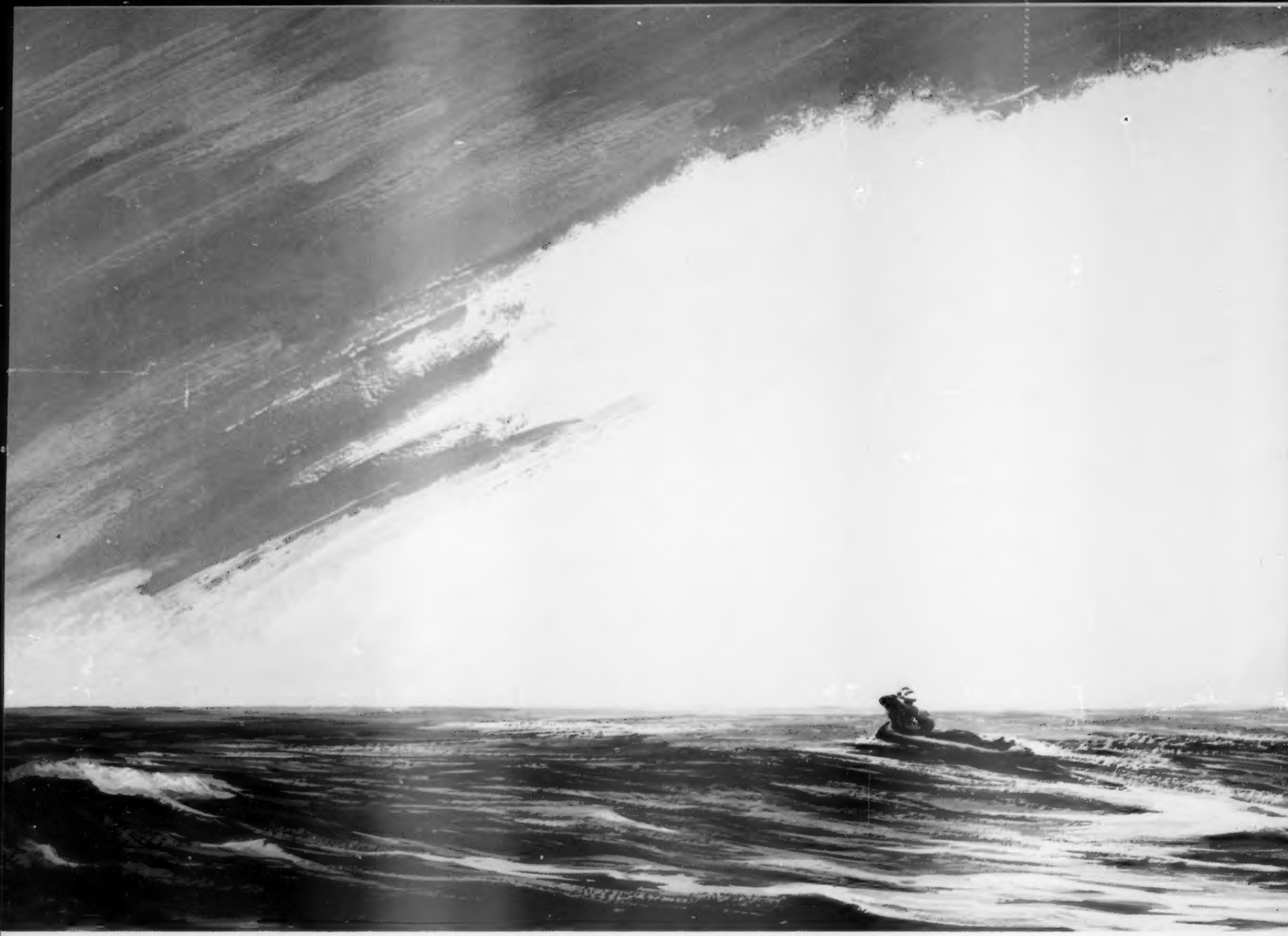

THIRTY minutes out of NAS Dallas, while cruising along at FL290 in a P-3, I was forced to shut down the No. 1 engine for a chips light. We notified ARTCC of our problem and requested a descent to FL210. Center asked us if we required any special handling. "No sir; radar vectors to a visual, please." No big deal, right? Weather was nice, and what's so tough about a P-3 with one engine out?!

Routing to Dallas was about as direct as it could be – right to an 8-mile straight-in approach to Runway 17. At 6 miles, Center handed us over to Navy Dallas Tower. On our initial call-up, I said to the copilot, "Make sure they know we have one engine out." Tower then asked, "Are you declaring an emergency?" "Negative" was our reply. "Roger, then continue and report 3 miles with gear," answered the tower. All was looking great as we proceeded down the glide slope, went to full flaps, and prepared to enter the flare.

Tower then called, "Go around; aircraft on the runway." Damn, what timing! Why can't the tower personnel use their heads after you tell them you're on three engines? Boy, that P-3 was sluggish on a three-engine go-around. Maybe I should have declared an emergency after all and gotten priority for landing.

Just as I was approaching the 180 to try again, I heard another P-3 report at 8 miles for a straight-in. You guessed it! I, with one engine out, was directed to take interval on the P-3 on final. I suddenly felt like I had egg all over my body. It sure was dumb playing around when it was so dark out and with one engine feathered.

After it was all over and I was safely on the ground, I analyzed my reluctance to declare an emergency. I pacified my ego as best I could. Somehow it was the way they asked "Do you want to D-E-C-L-A-R-E an E-M-E-R-G-E-N-C-Y?" It was like asking, "Do you want to DECLARE WAR???" Well, from here on out, ego be damned; there will be no reluctance on my part to go ahead and declare an emergency. ◄



# "What now, Batman?"

By LCDR C. T. Fowinkle
SAR Model Manager

WHAT are those fire warning lights doing on? Why doesn't the oil gage work? What is that smell? It can't be my RIO's cigarettes. Ah, come on, we have to be going faster than 10 KIAS. What's that noise? Where's my canopy? Where's my RIO? Oh, no, where's my airplane? @!?!

Well, here I am, sitting in my raft. The ejection sequence has worked as advertised. I'm out of the aircraft and in the water. I have safely removed my parachute, escaped the entangling shroudlines, and discarded my oxygen mask. The top half of the RSSK and I are sitting high and dry in my liferaft.

Suddenly, it comes to mind that there is one more phase of this operation, and that is the rescue. What did those DWEST fellows say back there at school in Pensacola? Was I to stay in my raft or get out of it? Just what was I supposed to do?

Let's take inventory and find out what I have in my survival kit that can help get me rescued. Signaling devices come to mind. How many do I have? In the SV-2 Survival Vest (that's that big lumpy thing that's around my chest) I've got a pencil flare, a signaling mirror, the PRC-90 Radio, and oh, yeah, I've got that flare. Which end was I supposed to light when I saw the aircraft? Oh, yeah, I remember, the end with the knobs around it – that's the night portion of the flare. The smooth end is for day. Better be careful though; let's make


sure there is no fuel in the area when I light this thing off. How about the rest of my survival equipment? Everything seems to be here, including the little piece of chewing gum.

Well, I'm beginning to recall some of the things they taught me at the survival school. Did that instructor say that a successful rescue was a team effort? If it's going to be successful, I obviously have a part to play. When first observing the aircraft or helicopter, it would be a good idea to light off the pencil flare if it is a good distance away. If it's a helicopter and he sees a pencil flare and turns in my direction, the pilot will need to know which way the wind is blowing. It's time to get ready to light off the Mk-13 Mod 0 flare.

Another thought comes to mind. How's that helicopter going to get me from down here to up there, assuming it's coming in my direction? What is that guy doing to me? What did he throw at me, and why is he going away? Oh, yeah, I remember, he's marking my position and he's going to make a U-turn, slow down, and come back downwind to get me. He has that rescue swimmer onboard, and he's coming into the water to help me. What am I supposed to do now? Should I get out of my raft, or just sit here and wait for the rescue swimmer to come to me. Well, it's time to take inventory again. Just what do I need to do to help that rescue swimmer?

My LPA is inflated; I have no problems there. I've got my helmet. Oh, yeah, that instructor said it's a good idea to keep the helmet on because when I'm underneath the helicopter there's a tremendous amount of salt spray that can blind me. So if I keep my helmet on with the visor down, I won't be in as much trouble. The helmet also provides head protection when being hoisted into the aircraft.

What else should I be doing? Well, let's make sure that I don't have any shroudlines around. I don't need my RSSK any more, so I'll discard that. Now everything looks good. I think I'll wait here until that rescue swimmer tells me what he wants me to do. Well, here comes the helicopter. Boy, that instructor was right; I can hardly breathe down here with all of that salt spray. There's the rescue swimmer with that smiling face! Boy, am I glad to see him! The rescue swimmer tells me to just relax and follow his instructions. He asks me how I feel and if I have any injuries. I tell him I don't, but the rescue swimmer gives me the once-over to make sure everything is where it is supposed to be.

The rescue swimmer then gives me a briefing on how we are going to get back up to the helicopter. The first thing I am supposed to do is get out of the raft and either swim away from it or puncture it to make sure it doesn't fly up into the rotor system of the helicopter. The rescue swimmer says he is going to hook up the gated D-ring on his harness to the gated D-ring on my MA-2 Torso Harness. He tells me he is going to signal the helicopter to move in and rescue us. Lastly, he tells me that once we are hooked up to the rescue hook and on the way up, to just relax and let the aircrewman in the helo put me inside the aircraft.

The above scenario is a hypothetical situation, but ejections and bailouts occur many times each year. It **can** happen to you. If you are put into a situation where "stepping out" of the airplane is necessary, what will you do? Survival training and your parachute riggers can tell you what gear you have and what to do with it, but what about those unknown quantities such as the search and rescue crew and, specifically, the rescue swimmer.

The aviation rescue swimmer is a highly-trained and motivated individual who is not only fully qualified in his own aircrew rate, he is also trained as a helicopter rescue aircrewman. Each rescue swimmer undergoes extensive training for at-sea and overland, combat and noncombat, day and night rescue operations and combinations in between. A rescue swimmer trains for swimming, rappelling, tree extraction, parachute disentanglement, and waterborne lifesaving procedures. In short, he is trained to save lives and prevent injury to downed aviators, and he is trained sufficiently to know what he is doing and why. In fact, a rescue swimmer knows more about aviators' survival equipment than do most aviators.

If you are ever forced to leave an airplane that is no longer operational and find yourself floating in a raft and watching a rescue swimmer approaching, follow his instructions. If he tells you to get out of your raft, get out; if he doesn't, don't. Cooperate with your friendly neighborhood rescue swimmer, because the posterior he is trying to save is yours.

THE title of this piece could well be "plane drops keep falling on my head." Various parts of aircraft and other equipment departing our "birds," both in the air and on the deck, continue to plague the naval aviation community. If you want to see the "old man" pucker, turn red, and blow flames out his nostrils, tell him that one of his aircraft just dropped a fuel tank, or whatever, on some poor unsuspecting local citizen's property. Following are some of the more recent "identified-flying-object" incidents.




# IDENTIFIED FLYING

By Russ Forbush
APPROACH Writer

• An H-53 was rolling wings level from a 30-degree angle-of-bank right turn at 800 feet AGL, 118 KIAS when the copilot's window came open. The window proceeded past the mechanical stops to a position in the windstream 90 degrees relative to the aircraft. The copilot informed the pilot of the situation and he began to reduce airspeed. At this point, the window and frame departed the aircraft. The pilot commenced an immediate precautionary landing and, while doing so, contacted the local NAS and declared an emergency.

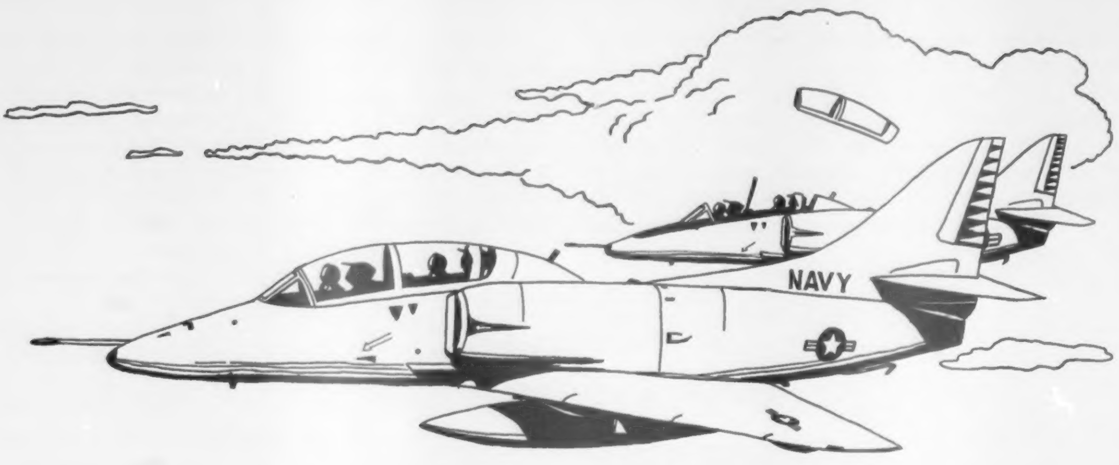
# OBJECTS

The H-53 made an uneventful landing in a civilian parking lot. The copilot stated that he visually sighted the window secured with the handle closed and the handle blade in the slot during the pretakeoff checklist. However, it is suspected that even though the handle was secured, the two lower window locking pins did not latch completely, thus allowing negative pressure on the window caused by the slipstream and/or vibration to open the cockpit window. When the pilot began his deceleration, the stress on the open window was sufficient to deform the frame or shear the upper pins, causing the window structure to depart the aircraft.

Subsequent inspection of other squadron aircraft turned up another H-53 with the window locking handle secured and the handle blade in the slot but the two lower locking pins not engaged in their respective holes. The CO stated, "The possibility for catastrophic results in an incident such as this is very real. All flightcrews have been briefed on the necessity of ensuring that all windows are properly preflighted. In addition, pilots have been briefed in detail that closure of the window locking handle is not sufficient to ensure that the lower window locking pins have engaged. These pins must also be observed as the handle is secured. Loss of any panel/window assembly from a helicopter is much more critical than that of a fixed-wing aircraft because of the proximity of rotating flight components. Loss of a tail rotor, due to impact damage, could ruin your whole day."

• A TA-4J was number two in a section cross-country flight. Approximately 45 minutes after departure, and while flying in loose cruise formation at FL330, the aircraft experienced a loss of normal electrical power. The instructor at the controls advanced the throttle, in order to close on the lead aircraft, and visually located the emergency generator release T-handle. He then transferred his scan outside the aircraft to check his closure on the lead aircraft and proceeded to deploy the emergency generator. The canopy instantly separated from the TA-4J. The instructor immediately initiated a descent, selected emergency on the IFF, and elected to divert to the nearest suitable airfield. Radio communication was eventually established with Approach Control and an uneventful landing was completed at an AFB.

The instructor did not recall pulling two different handles. During the descent, he observed the fuel boost caution light to be on, indicating that emergency electrical power had been activated. After landing, the emergency generator was found in the deployed position and the canopy jettison handle was lying atop the IFF control box. This incident resulted from




the pilot becoming distracted with outside scan while activating the emergency generator release T-handle. He inadvertently jettisoned the canopy.

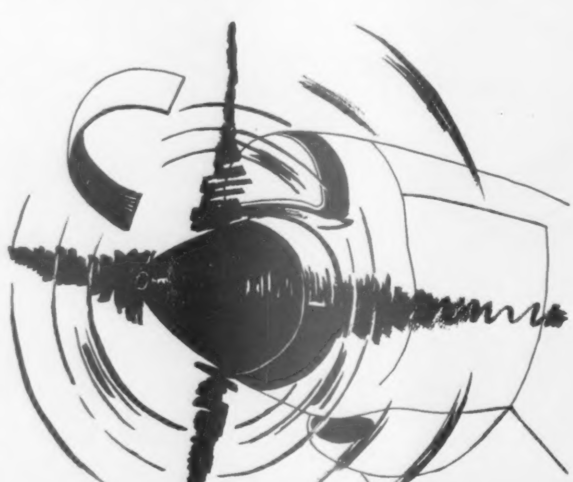
The pilot's CO had the following to say about this one: "The instructor involved in this incident is relatively new to the squadron, but is a fleet-experienced aviator with 1,500 hours of flight time. He has impressed me as an enthusiastic and skillful pilot who displays no unsafe tendencies or disregard for regulations. In this instance, his sequence of actions in correcting the electrical failure was inappropriately influenced by concern for section integrity. His overriding concern for formation position diverted his attention from the primary task at hand – to deploy the emergency generator. This brief, seemingly routine moment of distraction resulted in the loss of a canopy. Once the canopy was jettisoned, the instructor's quick and decisive reactions undoubtedly prevented any personal injury and possible loss of the aircraft through inadvertent ejection, but this does not mitigate the original transgression. Activating any emergency control without visual confirmation is potentially dangerous. This is a fundamental principle of professional flight discipline that has been clearly reemphasized to all pilots in this command."

• An OA-4M took off from an MCAS on an IFR flight plan under VMC conditions. When the aircraft was approximately 1 mile from the end of the runway at 1,000 feet AGL, an observer on the ground saw something fall from the OA-4M. The aircraft was recalled and an inspection revealed that the fuselage fuel cell access door was missing.

This incident occurred because the flightcrew was not thoroughly familiar with squadron operating procedures which require that the access door be left unsecured for pilot preflight. The CO commented, "This is another instance where the flightcrew made the assumption that a cover was secured by the ground crew – with potentially disastrous consequences. Thorough and complete preflight procedures have been reemphasized to all aircrews, and the command is reevaluating the procedure of having the fuselage fuel cap cover opened for pilot preflight."

• An AD3 was assigned to adjust an NTS bracket on the No. 2 engine of a P-3B. Since a mech toolkit was not available at the time, he checked out an airframes toolbox from the tool control center. After several attempts to complete the assigned task with insufficient tools, he set the afterbody on the afterbody mounting brackets and returned to the powerplants shop with the airframes toolkit and the afterbody bolts. About 1 hour later, the proper toolkit was available and he returned to the aircraft to complete his assigned work, leaving the afterbody bolts in the shop spaces.

Upon completion of the NTS adjustment, he again placed the afterbody on the supporting brackets without securing the springbolts or replacing the afterbody bolts since additional adjustments were required. He returned to the shop and briefed the oncoming and offgoing shop supervisors concerning the work he had completed and that the afterbody had not



been secured. The information was acknowledged, and the AD3 secured. Subsequently, the shop supervisor dispatched an AD1 to complete the necessary adjustments to the No. 2 propeller blade angles and sent along a second AD1 as the CDI. Both AD1s verified the blade angle settings and replaced the atmospheric cap through the afterbody access panel. They secured the access door but neglected to notice that the afterbody bolts were not installed, three of which were visually within 3 inches of the access panel.

The aircraft was cleared for an open cowling turn to accomplish a bleed air leak check in conjunction with the NTS-at-flight-idle troubleshooting checklist. Shortly after the engine was started, the top afterbody was freed and thrown through the propeller. The flight engineer promptly secured the engine in accordance with NATOPS.

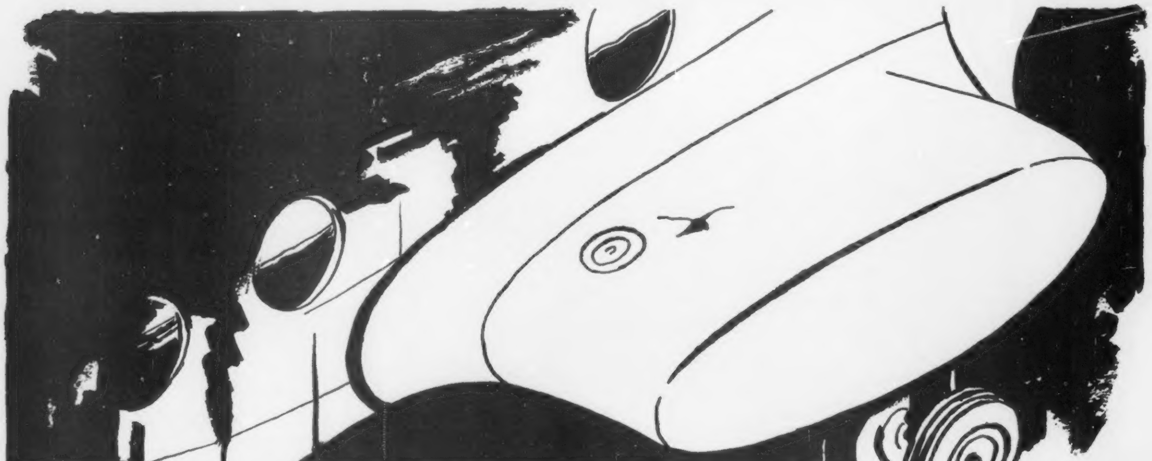
If you don't think the skipper of this squadron was blowing flames out his nostrils in regard to this incident, read the following: "Fortunately, no injuries or major damage resulted from this unnecessary ground incident. The circumstances surrounding it are straightforward: inattention to detail, improper supervision, lack of effective supervisor-to-supervisor communication, and complacency. All division officers, branch officers, and shop supervisors have been graphically informed of their individual role in the command safety posture. The importance of work center coordination and the critical nature of the maintenance control interface simply will not be glossed over. Maintenance instructions are currently being reviewed and specific work center training programs are evaluating the lessons learned from this ground incident. The shop supervisors that 'failed to supervise,' after acknowledgement and knowledge concerning the missing bolts, will be dealt with. Enough is enough."

• An SH-3H plane captain was conducting aircraft turnaround inspection training with four plane captain trainees. While inspecting the port sponson, the plane captain noticed a smoke launcher safety pin was missing. He was explaining where the missing pin was supposed to be installed when one of the trainees inadvertently touched the smoke launcher release pin. The smoke launcher fell to the deck, damaging its actuator.

This incident was caused by a lack of proper supervision and violation of line SOP (moving an aircraft without all safety pins installed). The boss of this unit says, "Appropriate supervisory and line personnel have been personally counseled and corrective action initiated. Line SOP has been reemphasized to all movement crews and troubleshooters, and proper procedures for reporting safety pins have been promulgated."

• Before performing periodic NDI of the FWD/AFT vertical shafts on a CH-46D, the inspector placed his test equipment case on the walkway adjacent to the sync shaft tunnel. The ship took a moderate roll and the unsecured case fell, impacting the upper surface of the port stubwing adjacent to the gravity refueling port. A 2-inch diameter hole was inflicted in the stubwing skin. The CO's response to this incident was: "It is totally unreasonable to expect that a smooth-surfaced test case will stay put on an open, narrow aircraft walkway without some sort of restraint. All hands must be briefed on the results of this expensive oversight and of the importance of adherence to simple precautions in order to prevent similar future mishaps."

One thing comes through "loud and clear" in regard to the above incidents – personnel failed to be thorough in carrying out their assigned duties. When work becomes routine, complacency sets in and accidents are likely to occur. Every unit CO needs 100 percent participation by his personnel if the safety program is to be successful – *it isn't a one-man operation.*



Capt Greg Raths and Maj Marty Bender

# B

BRAVO



## Maj Martin Bender and Capt Gregory Raths

AN RF-4 aircrew from VMFP-3 Detachment Bravo located in WestPac with MAG-15 encountered a very tense situation that called for immediate, crucial decisions on their part. Capt Greg Raths, the pilot, and Maj Marty Bender, the ARO, were completing an FCLP period at MCAS Iwakuni Japan when an electrical fire started in the rear cockpit of their aircraft.

Just after rotation from a touch-and-go, Maj Bender transmitted to Capt Raths on ICS that he had sparks and smoke coming from the left console in the aft cockpit. Capt Raths took immediate action, in accordance with NATOPS, by pulling the emergency vent knob, deploying the ram air turbine, and securing the generators. Just prior to securing the generators, all aircraft electrical power was lost. The RAT was ineffective and consequently all further ICS communications between the front and rear seats ceased.

The rear cockpit quickly filled with thick black smoke, making it impossible for Maj Bender to see outside or forward into the pilot's cockpit. Aware of the fire next to him, Maj Bender elected not to jettison his canopy to avoid aggravating the situation with a drafting effect which could spread the fire and possibly draw it up around his seat and himself.

Maj Bender was able to maintain his composure in a near-zero visibility environment. He obtained spatial awareness by observing the glow of the sun seen faintly through the smoke. Noting the sun in its appropriate position and moving from right to left, he determined Capt Raths had the aircraft under control and was turning off the 180-degree position in the landing pattern.

Meanwhile, when the aircraft buffeted as he turned downwind, Capt Raths sensed that the flaps had gone to the trail position due to the electrical failure. With the angle-of-attack indicator now inoperative, he increased the IAS to ensure that a safe no-flap approach could be made. The emergency vent knob activation satisfactorily kept smoke out of the front cockpit, and Capt Raths was able to maintain control and fly the aircraft with only a visual horizon and the pitot/static instruments. The hook was lowered, and an E-28 arrested landing

was made. Both aircrewmembers quickly egressed the plane without injury. The crash crew arrived moments later and extinguished the fire.

Investigation later determined that a massive electrical short had occurred in an electrical wire bundle beside the rear seat. The thick black smoke was produced by the fire spreading through several additional wire bundles in the rear cockpit.

The crew's calm analysis and reaction to this critical situation prevented the loss of an aircraft. Equally important, the successful recovery of this aircraft enabled many questions to be answered, and similar RF-4 mishaps will hopefully be prevented.

## LT Dave Jones and LTJG Gary Black

WHILE practicing simulated emergencies, a VF-213 aircrew was suddenly confronted with a real emergency not covered in the F-14 NATOPS. At the completion of an FCLP period, which had included simulated single-engine approaches, no-flap approaches, and other degraded system approaches, LT Dave Jones (pilot) and LTJG Gary Black (RIO) were preparing for a full stop landing.

As the F-14 approached the abeam position, its rudder pedals suddenly slammed full left, and the aircraft began a violent left yaw which the pilot attempted to counter with right lateral stick. Although not able to completely correct the left yaw, LT Jones was able to establish a positive rate of climb while controlling the rate of left turn with right stick. LTJG Black verified that both rudders were hard left and declared an emergency. An immediate arrested landing was requested on Runway 24 (Miramar's long runway). The tower requested that they land on Runway 28 (the primary controlled arrestment runway). After carefully assessing aircraft controllability, the crew decided to attempt the arrested landing on Runway 28. LT Jones discovered that, at landing speeds, he could only maintain directional control by use of differential power (mid-range power settings on the left engine and IDLE on the right).

The crew set up for the approach and was then informed by the tower that their arresting hook was not down. (The hook handle in the cockpit was down.) The approach was waved off as the crew realized that, once on the deck with the hardover rudder, directional control would be marginal at best, and running off the runway was a very likely possibility. During the waveoff, the flight hydraulic system failed.

In preparing for the second approach, the crew managed to lower the hook. Again using asymmetric power and lateral stick, LT Jones flew the aircraft onto the runway just short of the arresting cable for a successful arrested landing. Throughout both approaches, LTJG Black kept giving airspeed and altitude information to LT Jones and kept the tower informed of the situation.

Postflight inspection revealed that the flight hydraulic input and return lines to the rudder actuator had been reversed during a previous maintenance action, causing a failure of the rudder actuator and the subsequent hardover rudder condition. Subsequent to this incident, a new NATOPS change delineates procedures to detect this Murphy during preflight checks. AFC-638 will eliminate this Murphy potential.

The crew's flawless execution in this very difficult situation undoubtedly prevented this incident from becoming a major accident. They were faced with an *extremis* situation at low altitude, and by using sound judgment, superb airmanship, and correct procedures based on their complete knowledge of the aircraft, they saved a *Tomcat* that might well have flown its last flight.

Z
ZULU



# IS PADDLES ON STATION?

THE baby had just fallen off to sleep, and I was settling down to read the evening newspaper with strains of the "Wednesday Night Movie" drifting meaninglessly across the silver tube. My careful perusal of the financial page, seeking the ultimate in a risk-free, high-yield investment, had only begun when the relative calm of the moment was broken by the ring of the telephone. The last echo of the bells had barely disappeared when my wife's voice from the kitchen said "Honey, it's for you – someone from base ops." Moments after I had replaced the receiver and raced to the closet for my coat, she knew that, once again, an aircraft was returning to the field with a problem and had requested the assistance of a Landing Signal Officer.

I grabbed my keys, bounded through the door, and jumped

By LCDR J. T. Meister
VA-42

into the night to strap on my trusty *Spitfire*. As I cranked up the little import and started the relatively short drive toward the base, my mind seemed to be racing ahead at a furious pace. While I was in a great hurry to get to the base, I was careful not to exceed the speed limit to a ridiculous degree. By the time I could explain to a police officer what an LSO does, let alone describe the current problem, my services would no longer be required and I would no doubt get the opportunity to reexplain the entire episode to a judge. Not a good deal!

Traffic was light that evening, and I was soon pulling into a parking space in front of the tower. I grabbed the flashlight from the glove compartment and the A-6 PCL from behind the seat. Quickly trotting up the steps and into base operations, I was met by the operations duty officer. He informed me that there was an A-6 inbound with a hydraulic failure. "Shouldn't be too big a deal," I thought to myself, "as long as everything goes smoothly."

My thoughts turned toward the seemingly endless nights I had spent on the platform at sea and how the darkness, when coupled with a pitching deck, had forced the LSOs and aircrews to maximize their skills to safely and efficiently recover the airborne aircraft. It was a good feeling, having accomplished such recoveries with a minimum of trauma, and I remembered that I had doubted I would ever get a similar feeling of self-satisfaction from waving at the field.

At that moment I was jolted back to reality by the duty driver, who informed me that the truck was ready to go. We would be taking the aircraft on Runway 32R. Out we went and started up the truck. I was glad the driver was with me, as he was thoroughly checked out on the radio gear in the truck and was fully capable of hooking up the external power to the truck in minimum time should our internal power supply fail. He could prove valuable in making last-second lens intensity adjustments with the aircraft on final approach as well.

As we sped toward the runway, I refamiliarized myself with the communications setup of two UHF radios and two FM radios. I was glad that I had taken time to get checked out on this gear one afternoon when I had nothing else to do and that I had brought my flashlight along in the now dark truck.

I reached under the seat and pulled out the "tactical jet field arrest data" that was in a notebook. I reviewed the max engaging speed for an A-6 in the E-28 gear. The senior FRS LSO at the station had compiled and provided this book, and it was very helpful.

I called the tower on one of the FM radios and asked the supervisor for the side number and frequency of the emergency aircraft. I was told that Atom Buster 516 was the aircraft, that he had suffered a hydraulic failure, and that his approach would be on 363.6 MHz. It was not until I had switched up on that frequency and spoken to the crew that I was told the left mainmount was still up-and-locked and all attempts to lower it had proven fruitless.

The plot was thickening. We were now approaching the runway, and I told the driver that I wanted him to park just on the approach side of the arresting gear. Since the pilot would be planning a fly-in type arrestment, the OLS would be of little value once the ball floated off the top of the mirror in-close. The pilot would require a large amount of glidepath information, and as an aid to his depth perception, I had the truck parked so that the headlights would illuminate the arresting gear but not be in the aircrew's eyes on the approach.

All of the options had been reduced to one; it was time for the aircraft to land. A quick check of the fuel which had been dumped to minimum in accordance with NATOPS revealed that Atom Buster 516 had enough gas for about four passes. Although he was not *fat* on fuel, I knew I would not accept a poor set-up just because of the perceived sense of urgency.

I noted that the microphone I was holding was not a noise-suppressor type and thought how nice it would be to have a shipboard type handset installed in the truck. As a result, I elected to stay in the truck with the windows closed in case I needed to make a critical call as the aircraft was abeam my position.

Atom Buster 516 was now at 3 miles on final. A look at the windsock confirmed that the crosswind was from the *bad* side of the airplane and would not aggravate the situation. As he got to the in-close position, the pilot broke his rate of descent to let the ball float off the top of the mirror and flew a picture-perfect pass into the gear, on centerline. The amount of sparks as the *Intruder* settled down onto its left droptank was remarkably small, and the aircraft rapidly came to a halt just off the left side of the runway. The engines were secured when I called "Good trap," and the crew calmly climbed out.

I instructed the driver to drop me back at base ops where I got out of the truck, jumped into my *Spitfire*, and drove off into the night. Not only had that self-satisfied feeling returned, but I could still catch the last half of the "Wednesday Night Movie." ◄

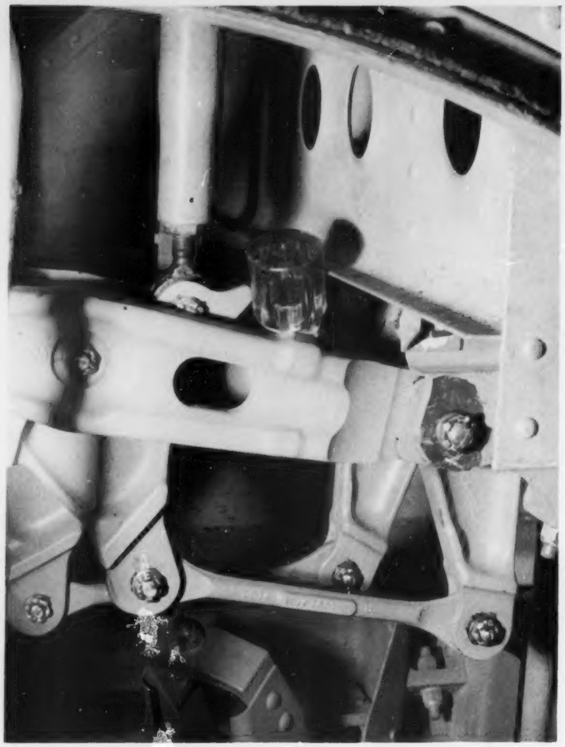



Take my Porsche . . . my Playboy Club key . . .
even my heavy pencil . . .

# ANYTHING BUT MY STUBBY!

By LT Dick Plush
HC-3

SUCH are the verbal fireworks ignited when the subject of pilot and aircrew personal tools is volleyed about the readyroom. Everyone knows that prior to one's first attempt to slip the surly bonds of earth, an invisible surgical tie is created between the flightcrewman and his or her stubby/dzus key/TL-29/Swiss Army knife which neither God nor the aviation safety officer can separate. For convenience, we shall abbreviate the above selection of tools as Flyers' Opening Devices, or FODs.



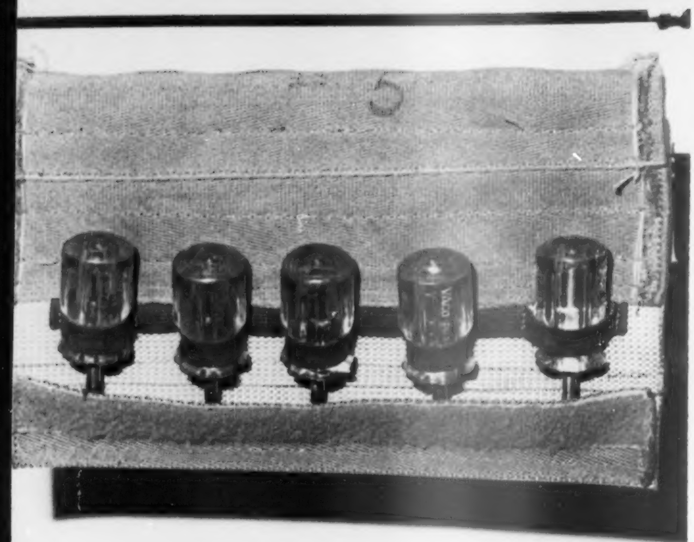
The nature of the flying beast, in our case a two-headed, Graybacked, Whistling Helicopterodactyl (a VERTREP H-46), requires that an individual conducting a preflight inspection have some manner of FOD with him in order to open panels, clamshells, and the like. Having been a hallowed, sacred, and highly personal implement since the days of Icarus, the FOD generally lives in any one of a thousand nooks on the aviator's person: in side-slung pouches; in over-shoulder holsters; in pocket depths replete with tobacco ashes, *M & M's*, and pieces of NATOPS pocket checklist performance charts; on necklace chains made of safety wire, bear teeth, and matzo balls; tucked in socks, jocks, or boondocks; secured by velcro, super glue, silly putty, magnets, a dab of yesterday's chaw, or The Force; personalized by filing, carving, taping, shaping, lathing, scotchbriting or spackling; and finally, identified with the aviator's name, mama's name, PRD, SSN, C.B. handle, blood type, and religious preference. Asked how long he has possessed such a jewel, the intrepid soarer replies, "I don't recall much about that period, except that I had a lot of gunk on my eyes, and some guy was spanking me just for being there."

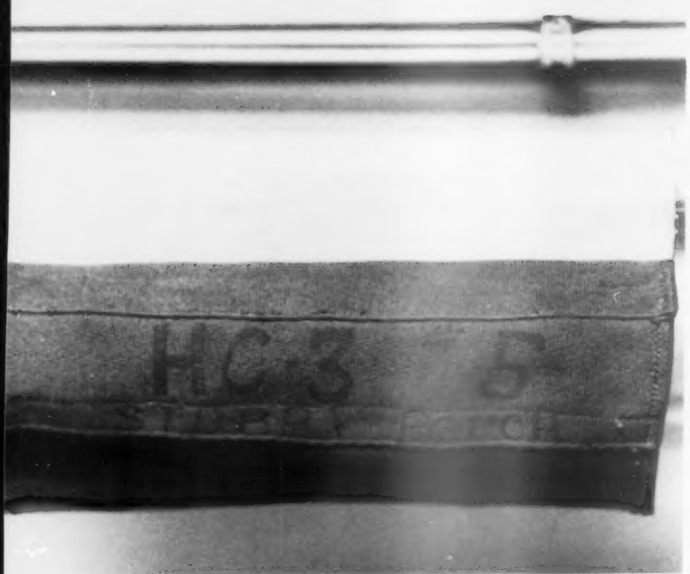
Traversing such inviolable territory with the intention of changing its nature would require nerves down to your ankles and the skin of a rhino, not to mention having an acceptable alternative. Such was the challenge we faced when we finally admitted that our fleet-acclaimed Positive Tool Control Program (MECH magazine, Summer 1979) was being insidiously circumnavigated by our affinity for personal FODs. Up until that time, it had been assumed that "personal accountability" was adequately taking care of these items. But when our new program required the turn-in of squadron-owned FODs, the number received was abysmally low. We found that many had been "misplaced months ago," presumably lost in the laundry, and predictably, that many individuals had for years possessed their own various FODs which were in no way documented in the squadron. Add to this the figure provided by the Aviation Safety School in Monterey, CA that tools are found in **80 percent** of crashed aircraft (whether or not the tools were contributory to the accident) and you have a large potential for FOD-related mishaps.

To what degree should positive tool control impact upon aviators' personal equipment? Should pens, pencils, nav computers, combs, watches, and cigarette lighters be included? The answer to this question may vary from one community to another depending upon the hazards these items present to the particular aircraft involved. Flying helicopters with permanently installed inlet screens over engines and with negligible inlet suction, we found our major hazard to be from relatively small, thin, hard objects. Being difficult to break or bend, these are liable to become lodged in confined areas and either jam flight controls or fly off rotor heads and become lethal missiles. Most pens, pencils, lighters, and such are of light mass and would probably bend or break under the forces involved, but the metal shaft of the stubby screwdriver or its equivalent is a most unforgiving item. With these assumptions made, we have designed, locally manufactured, and implemented the use of what we call the Stubby Pouch.

Choosing a recent safety standdown as a logical time to introduce the program, we asked all pilots and aircrewmen to turn in their squadron-owned tools and take home the tools they personally owned. Our industrious aviation equipment people constructed five Stubby Pouches, each of which contain five stubby screwdrivers (corresponding to the maximum number of aircraft which would be flying at any one time and the maximum number of people who would preflight an aircraft at one time). The pouches are made solely of canvas webbing, velcro strips, and elastic banding. The stubbies are FOD-taped and identified by engraved number (pouch No. 1 contains stubbies No. 1-1, 1-2, 1-3, 1-4, and 1-5). A flap folds down to make an enclosed pouch for carrying out to the aircraft. The pouch is hung and secured by velcro from a cargo litter rail inside the aircraft, away from the main cabin door to preclude excessive flapping around during flight. When mounted, the pouch may be secured open for instant inspection, and a special strip at the bottom will catch a reversible (phillips/straight slot) shaft if it slips out of the screwdriver body.

Continued






The Stubby Pouches are issued by maintenance control along with the aircraft discrepancy book. Generally, the crew chief is the first to preflight, and he inventories the stubbies, records the pouch number on the "A" sheet, and takes the pouch out to the aircraft. The aircraft commander soon thereafter places his initials next to the pouch number on the "A" sheet, signifying that he is taking responsibility for the tools in his aircraft. As each flightcrewmember enters the aircraft, he takes a stubby from the conspicuously mounted pouch and conducts his preflight. Upon finishing his inspection, each person returns his stubby to the pouch. A local addition to the pilot's NATOPS pocket checklist just prior to starting the Auxiliary Power Plant reads: "Personal equipment – check." This allows the crew chief to report "All stubbies present" and affords each crewmember a moment to check his LPA, zippers zipped, kneeboard and pencils present, etc.

After flight, the stubbies may be used for postflight, and the aircraft commander ensures the return of the pouch to maintenance control as he initials its return on the "A" sheet. If a pouch is missing, the aircraft commander is immediately contacted.

Initially, this system drew the predictable anonymous skull-and-crossbone memos and suggestions of various comical alternatives (example: surgical implantation of a straight slot screwdriver point on the left forefinger and a phillips point on the right forefinger). However, after a reasonable amount of time in which to alter old habit patterns, most crewmembers agreed that this is a very simple and workable system, compatible with the spirit of positive tool control. It also eliminated the need to issue and account for stubbies for each individual pilot and aircrewman and removed any doubt of whether anyone had lost his personally-owned Swiss Army knife in the flight controls of an H-46. So, the next time someone asks, "Where's my !X?! stubby?" tell him: "Where all FODs belong – in the pouch!"

Patience is something you admire in the driver behind, but can't put up with in the driver in front of you.

Ace L.

# FOUR-LINE RELEASE SYSTEM PROCEDURES

By CDR Jack Greear, MSC
APTU Norfolk
NAVREGMEDCEN, Portsmouth, VA

AIRCREW Systems Change 383 directed the installation of a four-line release system on parachute assemblies that employ the 28-foot circular canopy. The installation of the four-line release system will provide:

• Reduced incidence of nausea and parachute landing injuries by eliminating parachute oscillations inherent in flat circular canopies.

• Improved directional control and maneuverability for selecting a more desirable landing site.

• A forward velocity of 3 to 4 knots in still air. This forward velocity can counteract the effects of surface winds by turning the canopy into the wind.

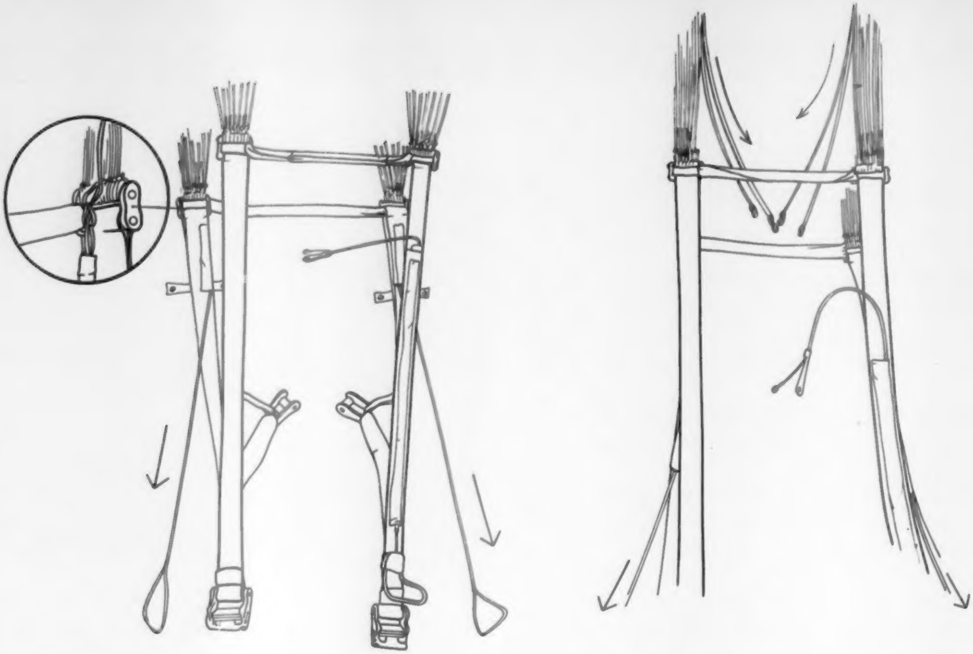
• Reduce the potential of entanglement with the raft or survival kit and parachute suspension lines after water entry.

The following scenario describes and illustrates the procedures for utilizing the four-line release system after initial postejection/bailout procedures (i.e., inflate LPA/LPU, snap waist lobes together, deploy RSSK, raise visor, remove oxygen mask, and remove gloves) have been completed.

1. Check the condition of canopy. **If the canopy is damaged or suspension lines are broken or entangled, do not use four-line release.** Also, use of the four-line release is not recommended at night because of the difficulty of properly inspecting the canopy and suspension lines for damage.

2. If the parachute is undamaged, locate pull loops located on the inside surface of the rear risers approximately 26-28 inches above the Koch canopy release fittings.

3. Pull downward on both loops with a sharp tug (12-inch pull requiring about 20 pounds of force).



4. The pull loops are attached by a "daisy chain" coupling to the four rear suspension lines at the connector links.

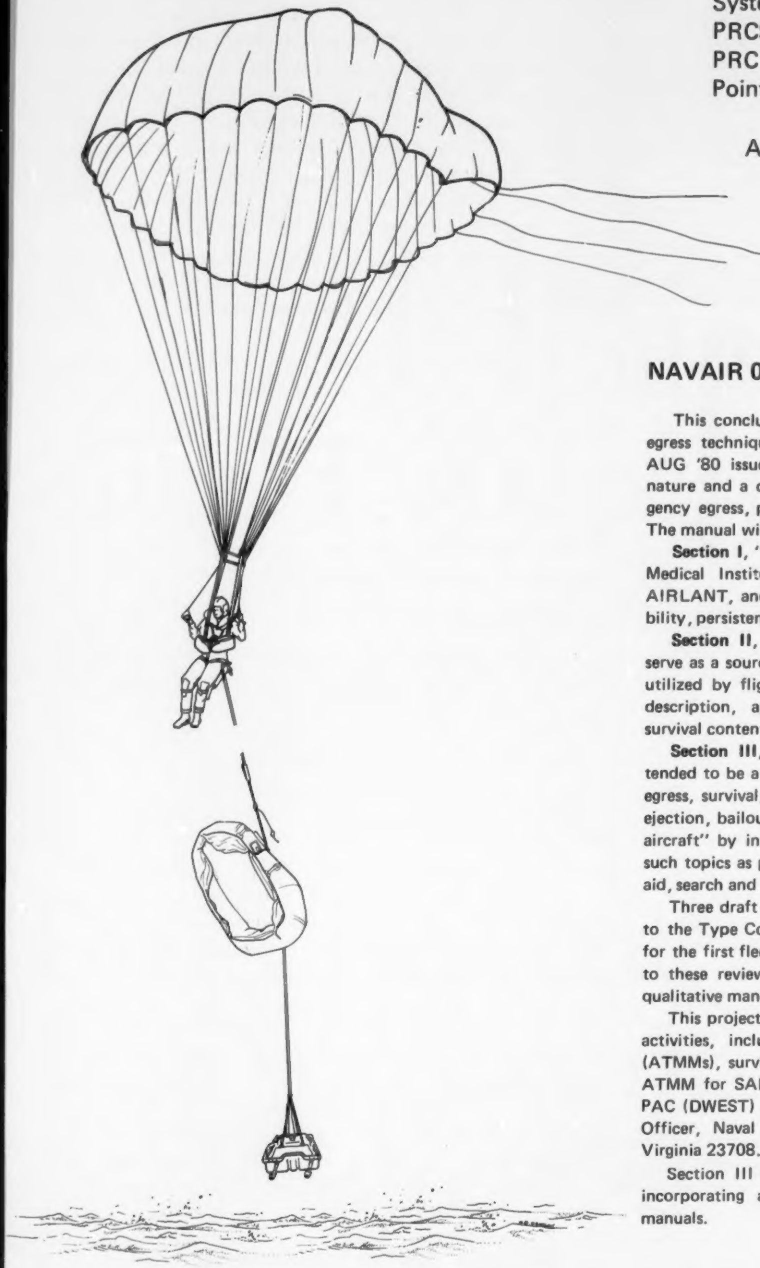


5. To turn left, pull down on the left lanyard pull loop.

6. To turn right, pull down on the right lanyard pull loop. A 360-degree turn can be navigated in approximately 20 seconds and less than 800 feet descent altitude.

NATOPS Evaluators for the Four-line Release System are: CDR Harold T. Pheeny and PRCS Robert Hudson (NAVWEPCEN) and PRC Robert L. Pohlman (APTU Cherry Point).

Artwork by Carolyn Dinicola Fawley



## NAVAIR 00-80T-101 PROGRESS REPORT

This concludes the regularly scheduled monthly series of survival/egress techniques that have been published in *APPROACH* since the AUG '80 issue. The subsequent manual is intended to be general in nature and a composite of all the best data and procedures on emergency egress, post egress, descent and landing, and extended survival. The manual will consist of three major areas.

**Section I**, "The Will to Live," is being prepared by Naval Aerospace Medical Institute and Aviation Medical Safety Office, COMNAVAIRLANT, and will discuss volitional traits such as confidence, flexibility, persistence, etc.

**Section II**, "Life Support Equipment Procedures; detailed," will serve as a source document on various pieces of life support equipment utilized by flight personnel. Each item will be discussed in terms of description, application, use procedures, pertinent modifications, survival content items (if applicable), and operation difficulties.

**Section III**, "Usage of Life Support Equipment/Systems," is intended to be a composite of the best available data and procedures on egress, survival, and rescue. Techniques for emergency ground egress, ejection, bailout, and ditching will be presented for selected "specific aircraft" by integrating the information from Section II. In addition, such topics as parachuting techniques, survival first aid, emergency first aid, search and rescue and long term survival will be discussed.

Three draft chapters of NAVAIR 00-80T-101 have been distributed to the Type Commander "Advisory Group" and other subject experts for the first fleet review of the chapter coordinator's effort. Early input to these reviews should greatly assist in the production of a highly qualitative manual.

This project is being accomplished by a large number of cooperating activities, including appropriate aviation training model managers (ATMMs), survival schools, and the Naval Safety Center experts. The ATMM for SAR and Water Survival (NAWSTP) and FASOTRAGRUPAC (DWEST) are participating. The Project Manager is: Commanding Officer, Naval Regional Medical Center (Code 417), Portsmouth, Virginia 23708.

Section III of NAVAIR 00-80T-101 will be used as a master for incorporating appropriate procedures into aircraft model NATOPS manuals.

7. Prior to water entry, turn into the wind and position hands on Koch release fittings. When your feet enter the water, release Koch fittings. Turning into the wind provides spatial separation between the liferaft and survival equipment, the aircrewman, and the parachute, significantly reducing the chances of entanglement of these three entities with one another.

# When UP is Down

By LCDR Lew Smalley and LCDR Larry Gemma
HS-74

THE crash phone rang at 1030. One of our H-3s had declared an emergency because the collective could not be lowered! As the maintenance officer, I went outside to observe the H-3 coming back to Homefield (hopefully for a landing). About then, the airframes work center supervisor said, "I told maintenance control that the helo was down, but I guess my 16 years of experience didn't mean anything because they UPed it!" His words rang in my ears as I watched the helo make an uneventful landing and shut down. From that point on, however, things did not remain uneventful.



The pilot in command reported that a few minutes into the flight, the pilot at the controls had noted a momentary slight stiffness in the collective. He attributed this to the other pilot's hand or knee being next to the collective, and since it went away completely, nothing more was thought of it. About 10 minutes later, a climb was commenced. Upon attempting to drop the collective to level out, the collective could not be lowered! Needless to say, this caused much concern between the pilots. Experimenting further, they noted that climbing was possible but descending was not. At this point, they declared an emergency and elected to return to Homeplate, still trying to troubleshoot the problem. What was, in fact, happening was the feedback arm from the flight control bellcrank to the barometric altitude controller mechanism was resting on the drip pan and was causing the collective to bind whenever the collective was lowered. Since the two reserve pilots were applying a great deal of pressure on the collective (especially the state policeman), the collective was finally lowered because they bent (fortunately) the aluminum feedback arm that was binding on the drip pan. An investigation was immediately commenced to determine why we almost blemished our perfect safety record.

As the investigation unfolded, it was incredible that **communication gaps** had caused this near-accident. The helicopter had just returned from a 2-week exercise in the Caribbean during which a barometric altitude (bar alt) gripe was noted. It was an UP gripe, so the aircraft was flown home with the outstanding discrepancy. The helo immediately went into Phase "C" inspection, *after* the bar alt controller was removed and sent to AIMD for expeditious repair. During the Phase "C" inspection, maintenance control was notified that the bar alt controller had been removed, and a notation "bar alt controller removed" was made on the applicable VIDS board. Two things were assumed: first, that the part would be back and installed before the aircraft came out of phase; and second, that the collective would not be moved until the part was reinstalled. This latter limitation was not passed on to maintenance control.

This single action would have prevented the incident, which was potentially a catastrophic mishap. Convinced that the gripe was written up properly, the petty officer assigned to correct it commenced 10 days of well-earned leave as soon as his shift was over.

The tale continues with the helo completing Phase "C" inspection, during which no inspection of the bar alt controller is called for. The only paperwork of this downing discrepancy was an UP gripe reading, "Upload in collective with the bar alt on." During the plane captain's daily and turnaround inspections, he found the feedback arm resting on the drip pan. On his way to maintenance control to write up the gripe, the plane captain stopped in the airframes work center to ask a metalsmith to look at the problem. The metalsmith agreed that it didn't look right but indicated the discrepancy belonged to work center 220 – not 120! The plane captain then stopped by the electrical shop to have someone else look at the problem. After looking at the discrepancy, the electrician said, "No problem, you don't need a bar alt to have an UP airplane; you only need it for night or IFR!"

A piece of metal was hanging from a flight control screaming for attention, and benign neglect was everywhere. The tenacious plane captain went to maintenance control to write up his discrepancy, but the petty officer in maintenance control assured the plane captain that it wasn't necessary to write it up because there was already an outstanding discrepancy on the bar alt. "See, I even have this note in grease pencil on the VIDS board: 'Bar alt controller removed.' " Unfortunately, there still was no limitation against flight written on the yellow sheets, or anywhere else for that matter.

The next day, the flight schedule commenced with the helo certified safe for flight and issued to the flightcrew for a training hop. With a major discrepancy undetected on the records check and crew preflight, the aircraft launched.

By the grace of whomever is in charge of those great spaces in the sky, the helo returned for an uneventful emergency landing. The dragging aluminum feedback control arm caught in the drip pan, preventing the collective from lowering. Had it been stainless steel, our state policeman could not have bent it and landed safely. In this incident, our UP helo was really DOWN, and we were just plain lucky.



☆U.S. GOVERNMENT PRINTING OFFICE: 1981—735-003/7

# Head-on collisions killed 3,000 people last year.

## Don't make it 3,001!

Don't pass unless you're sure you can make it.

This professional
never has to think about flying.

These do.

Naval Safety Center
NAS Norfolk, Virginia

Poster idea contributed by ENS Austin Boyd, USN, VT-

C20